

Idaho National Laboratory Integrated Safety Management System FY 2016 Effectiveness Review and Declaration Report

December 2016



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December 2016

**Idaho National Laboratory
Idaho Falls, Idaho 83415
<http://www.inl.gov>**

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INVESTIGATION
OF THE

Management System for Total Electrophoresis and Diagnostic Report

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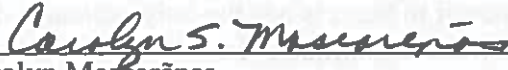
Approved by:



Mark Cox
Quality and Performance Management Director

12/15/2016

Date



Carolyn Mascarēnas
Environment, Safety Health & Quality Director

12/15/16

Date

EXECUTIVE SUMMARY

Idaho National Laboratory's (INL's) Integrated Safety Management System (ISMS) effectiveness review of fiscal year (FY) 2016 shows that INL has integrated management programs and safety elements throughout the oversight and operational activities performed at INL. The significant maturity of Contractor Assurance System (CAS) processes, as demonstrated across INL's management systems and periodic reporting through the Management Review Meeting process, over the past two years has provided INL with current real-time understanding and knowledge pertaining to the health of the institution. INL's sustained excellence of the Integrated Safety and effective implementation of the Worker Safety and Health Program is also evidenced by other external validations and key indicators. In particular, external validations include VPP, ISO 14001, DOELAP accreditation, and key Laboratory level indicators such as ORPS (number, event frequency and severity); injury/illness indicators such as Days Away, Restricted and Transfer (DART) case rate, back & shoulder metric and open reporting indicators, and reductions in Radiological Control (RadCon) reportable events, demonstrate a continuous positive trend and therefore improved operational performance over the last few years. These indicators are also reflective of the Laboratory's overall organizational and safety culture improvement. Notably, there has also been a step change in ESH&Q Leadership actions that have been recognized both locally and complex-wide. Notwithstanding, Laboratory management continues to monitor and take action on lower level negative trends in numerous areas including: Conduct of Operations, Work Control, Work Site Analysis, Risk Assessment, LO/TO, Fire Protection, and Life Safety Systems, to mention a few. While the number of severe injury cases has decreased, as evidenced by the reduction in the DART case rate, the two hand injuries and the fire truck/ambulance accident were of particular concern. Aggressive actions continue in order to understand the causes and define actions needed to prevent similar injuries and accidents in the future. While our injury rate is not where we want it to be, it is not the only indicator that defines our ISMS program, safety culture, and efforts to be a continuous learning organization. When reviewing the entire year's performance, and all areas that integrate ISMS principles and core functions, INL has an "*effective*" ISMS program that is continually improving.

Summary

Since August of 2014, BEA has been on an extensive lab-wide journey dedicated to improve and mature the performance assurance processes at INL, forming mission centers, Management Review Meetings (MRM's), Senior Management Review Meetings (SMRM's), Key Performance Indicators (KPI's), and also including schedules, expectations, and accountability. This endeavor defined the process for establishing performance expectations in support of the INL mission, monitoring and reporting performance information, and planning risk-informed and/or required assessments and assessment activities. This process drives attributes of a high performance organization through active real-time discussion, analysis, and ownership of performance among all organizations. The process is intended to promote continuous learning and collaboration between mission centers and support organizations that ensures efficiency, effectiveness, and understanding the health of the organization above and beyond compliance. This overall process includes maintaining the Integrated Safety Management System (ISMS) framework for performing work at INL at the Laboratory, Facility and Activity levels. The framework of ISMS established at INL ensures that all work is clearly defined, mitigated, and performed safely. This includes ensuring clear roles and responsibilities are understood, and that necessary regulations and requirements are appropriately rolled down and integrated within the process. Line management has the ultimate responsibility for safety, authorizing and releasing work, ensuring appropriate resources are allocated, risks are assessed, and oversight that work is performed with in the guidelines established. As this collaboration and continuous learning mentioned above takes place, BEA continues to mature and improve processes designed to execute these controls.

As part of Laboratory Agenda item II.1 "Optimized and Integrated INL Management Systems that Enable Research," BEA just kicked off the first pilot (starting with Property Management) of "INL Integrated Management System/LWP Redesign Workshop" designed to simplify, and make more intuitive workflows that deliver value to users, while seamlessly integrating all requirements. This improvement effort will continue to further mature clear roles, responsibilities, expectations, and requirements role down. This initiative plans to touch every management system by the end of February 2018, with intent to reap near term benefits and then achieve long term state-of-the-art processes (3 to 5 year) that demonstrate attributes of a Preeminent and Leading Research Laboratory.

This review and declaration is only going to touch on a few of the key management systems conclusions, highlights, initiatives, and concerns that support INL has effectively maintained ISMS core functions and guiding principles while improving where opportunity permits. The majority of the information that demonstrates INL's ISMS is effective and continually improving is available in depth in the periodic MRM's on the INL's SharePoint site @

<https://eshq.inl.gov/PerformanceReporting/SitePages/Home.aspx>.

Maturity of Contractor Assurance System (CAS): BEA's CAS was effective in implementing ISMS core functions and guiding principles as confirmed through evaluation of CAS metrics self-grading, DOE-ID evaluation of various CAS products, and observed performance in the field by contractor and DOE. The growing reputation of BEA's CAS is evident by external recognition, including an invited presentation to DOE-HQ and an upcoming highlight at a DOE CAS summit. Issues Management, Lessons Learned, Management Observations, and Performance Measurement and Analysis have all demonstrated programmatic and implementation improvements; continuing to show impactful utilization by BEA management. In addition to the positive, there are often examples found where we don't measure up to the expectations that have been established such as the high volume low threshold issues tracking intent, at ATR and MFC. Corrective Actions are underway to reinforce and remedy these deficiencies. These performance assurance activities demonstrate the continuous journey of improvement of integrating ISMS

core functions and guiding principles, particularly Core Function 5 feedback and continuous improvement.

BEA Senior Management Review Meeting (SMRM) evolved in a positive direction identifying more actionable results as an outcome of the meeting. The Operations Council provided important leadership and improvement actions for INL. BEA leadership clearly demonstrates accountability for safety, as indicated by the aggressive post event corrective actions when things do not go as planned such as the two finger injuries, firetruck/Ambulance incident, and the CFA Arc Flash event. As a result there has been significant improvement in safety culture from the linemen up the chain, based on the leadership by example of the BEA management team.

Independent Oversight conducted an evaluation of the effectiveness and maturity of the MRM process' ability to effectively drive continuous improvement, closing noted performance gaps, reversing negative trends, and addressing priorities commensurate with risk; resolving little problems before they become big problems, i.e., continuous improvement to clearer roles, requirements roll down, identifying hazards, mitigation, releasing work, etc. These are key aspects of effective ISMS implementation. The review noted metrics continue to improve and managers are demonstrating a deeper understanding of both the performance review approach and their respective organization's performance; i.e., line management responsibility for safety.

Quality Assurance (QA): INL continues to implement an effective QA program consistent with DOE Order 414.1D, *Quality Assurance*, 10 CFR 830 Subpart A, *Quality Assurance Requirements*, ANSI Z1.13, *Quality Guide for Research* and NQA-1-2008/1a-2009, *Quality Assurance Requirements for Nuclear Facility Applications*. BEA's Quality program has made marked progress in achieving a vision of an embedded, graded approach that seamlessly integrates ISMS guiding principles of requirements roll down and safety controls into all aspects of work. Internal Quality metrics have shown marked improvements over the prior year, and numerous improvement initiatives are reducing administrative burdens while maintaining appropriate rigor. The addition of quality staff is improving the ability to enhance the program from the user's perspective. The QA audit schedule has successfully covered all elements of the INL QA program over a structured three-year cycle maintaining effective requirements roll down.

The Idaho National Laboratory (INL) QA program overall has been effectively implemented and integrated with the Integrated Safety Management System during FY 2016. This conclusion is based on: comprehensive internal and external audits/reviews of the QA program, evaluation of QA metrics, input and review of QA program performance from the QA Manager's forum, monthly DOE-ID QA/BEA QA meeting, customer feedback from line organizations and DOE-ID, implementation of requirements, and program enhancements that are in addition to the established metrics in the Q&PM MRM report.

Work Planning and Control (WP&C): The Work Management Management System continues to be evaluated as "effective." This determination is based on standardized metric data for the functional areas of Work Control, Conduct of Operations, and Conduct of Maintenance as well as assessments, management observations, and improvement initiatives. The following is a list of recent or current improvement initiatives occurring within the Management System:

- Identification, evaluation, and Corrective Action assignment to mitigate adverse trend in LO/TO performance
- Revision of Conduct of Operations Core Training to reduce classroom seat time by 30 hours
- Revision of MCP-6611 to require Work Control Document reviews by a Quality Review Team
- Development of Master Equipment Lists and PM optimization efforts continue

- Hired two additional program Subject Matter Expert (SME)/Lead personnel

The implementation of a core set of metrics for Conduct of Operations and Work Control was accomplished this past fiscal year (FY 2016) providing a predictive and/or leading indication of performance based on self-critical engagement. To date, one formal evaluation was prompted by this metric data in regard to the adverse trend in Hazardous Energy Control (lockout & tagout). The establishment of a standing Operational Performance meeting and assignment of targeted improvement actions are additional indications that this data is value added and will continue to develop as the metric matures.

Pilot of the Work Control Risk Ranking tool within F&SS was completed and formally evaluated to be an “effective action that lends itself to long term effectiveness” within the organization and will continue to be utilized. While other organizations have established similar best practices that were found to be effective it is not likely that this tool (F&SS Risk Ranking) will be institutionalized across the laboratory at this time.

Work control related efforts in FY 2016 have been focused on the identification of programmatic improvements. Revision of the work control training modules and qualification standards were accomplished to ensure accurate standards for qualifications are in place that capture the needed knowledge, skills, and abilities, to safely execute identified tasks.

Evaluation of the hazard identification and mitigation tool (HaRPS) has identified an opportunity for improvement that exists in the area of user interface and information delivery. Methods to further understand these challenges have been deployed and investigation into proper correction remains a priority. Complex wide benchmarking, commercial off the shelf products, and cost to perform modifications are being evaluated to identify potential improvements that enhance end user experience. Overall WP&C has an effective framework to integrate the core functions and guiding principles of ISMS and is continually improving.

Occupational Safety & Health (OS&H): BEA’s OS&H program continues to implement and sustain the ISMS core functions effectively and consistently with 10 CFR 851, *Worker Safety and Health Program*. The OS&H Management System continues to demonstrate accountability on performance through clear ownership and commitment to OS&H Management outcomes. Each implemented OS&H Program is aligned with the ISMS construct with changes and improvements’ carefully prioritized demonstrating ISMS guiding principle, balanced priorities. Resources and capabilities are under constant scrutiny of OS&H Management to ensure effective outcomes. Processes are in place and work to quickly identify issues or problems and/or solutions such as: OS&H metrics, LabWay analysis and trending, clear goals, assessment and modification of OS&H training modules, carefully selected crucial safety communiques, enhanced procedures, procurement of safer equipment, improved employee training, development of employee safety leadership skills, Management Assessments, Management Observations, Self-Assessment activities, quarterly Management Review Meetings (MRM) and effective feedback from stakeholders and employees.

Events and errors are systematically addressed with solutions, actions, and lessons learned, that unite program owners with stakeholders towards achieving a high reliability organization and thus implementing key improvements to the ISMS framework. In FY 2016 a review of lab-wide performance related to injury/illness rates and not achieving desired results, led to many performance discussions and initiatives in an effort to reduce the number of injury and illnesses and also day away, restricted or transferred (DART) cases. Initiatives included brainstorming with Laboratory employee Safety Team leadership, advanced back and shoulder schools targeted at high risk work groups, targeted safety campaigns on slips, trips and falls, purchase of material handling equipment, two VPP passport activities,

piloted a Mindfulness course to enhance situational awareness, performed ergonomic evaluations, seasonal preparations throughout the Laboratory and multiple publications.

Management response and corrective actions on trends are timely, decisive and constructive. During FY 2016 OS&H demonstrated a renewed impetus on safety that reinvigorated the workforce and has improved motivation through the Employee Safety Teams.

The OS&H program overall is an effective program at INL and is evidenced by DOE-HQ's triennial review in FY 2016 of the Voluntary Protection Program (VPP), which also evaluated the ISMS core functions and guiding principles. The DOE-HQ team will recommend INL continues participation as a DOE-VPP Star site. Additionally, a major update of the INL Fire Protection Program to the requirements of DOE Order 420.1C underwent a DOE Idaho Operations office review and approval. OS&H was relentless to implement and promote culture improvement that stays focused on ISMS infrastructure and as a result is achieving excellent results.

Radiological Control (RadCon): The RadCon Organization has a sound program and is always striving for continuous improvement. With respect to ISMS, many significant radiological achievements and improvements occurred in FY 2016. INL added two new DOE Laboratory Accreditation Program (DOELAP) assessors, both of whom work in RadCon. In addition, RadCon successfully passed the test criteria and onsite assessment for DOELAP for the Direct (whole body and organ counting) and Indirect (urine and fecal excreta analyses) Radiobioassay programs. DOELAP is required by 10 CFR 835 and requires DOE contractors to successfully process and report Performance Evaluation Test samples and then undergo an onsite DOELAP assessment focusing on the quality, technical, and administrative aspects of the Site's Radiobioassay programs. DOELAP helps DOE ensure consistency and accuracy among Dosimetry Programs at DOE Sites and thus ensuring a safe work environment that protects workers within the established requirements and meeting ISMS intent. BEA is dedicated to providing these controls that protect the employees and the environment as efficiently and effectively as possible.

RadCon has added Dynamic Learning Activities (DLAs) to the Radiological Control Technician Continuing Training classes conducted each calendar quarter. The DLAs conducted are based on Battelle Memorial Institute's Laboratory Operations Supervisor Academy (LOSA). These DLAs give participants the opportunity to work together in role-playing scenarios in a safe learning environment. Real-life events, problems and behaviors are used to develop scenarios designed to challenge participants' knowledge and skills. A key element of the DLAs is that after the scenario is complete, the participants discuss their responses and are able to learn and share experiences with their peers and mentors. Outcomes from this process include, improved competence commensurate with responsibility, better understanding of roles and responsibilities, knowing when operations should be authorized to proceed, hazards are identified more effectively, demonstrated line management responsible for safety, etc.

In an effort to increase company awareness and understanding of roll down requirements (key aspect to ISMS) of 10 CFR 835 Subpart K (Design and control; Facility design and modifications) requirements, RadCon has launched a process improvement initiative to automate RadCon Operational Process Workflows. This initiative began with the enhancement of LWP-15032, "ALARA Optimization" and the availability of two electronic forms: ALARA Optimization Checklist (441.B05) and ALARA Design Review (431.01). These forms assist stakeholders to demonstrate ISMS guiding principles like line management responsible for safety by ensuring early involvement of RadCon during the engineering design process and management of projects designed to integrate ISMS core functions that identify and mitigate hazards to protect the employees and public.

INL RadCon worked with the Radiological Control Managers from Fluor, Idaho to issue a letter announcing that reciprocity will be acknowledged across the two contractors. The letter states that a

radiation worker with the DOE Core Radiation Worker I or Radiation Worker II training can enter the Radiological Buffer Areas (RBA) of the other contractor with the approval of that contractor's Radiological Control management, as long as the worker doesn't need to sign in on a Radiation Work Permit (RWP). If a worker needs to sign in on an RWP for the other company, they will need to take additional site specific "delta" training from that contractor prior to signing onto the RWP. Granting reciprocity for the core radiation worker training streamlines and simplifies access control requirements for those radiation workers who need to perform assessments, reviews, or walk-down an area managed by a different contractor; thus, saving time, money and frustration. This reciprocity also applies to DOE-ID employees who took the core Radiation Worker training from one contractor, but wish to enter RBAs managed by another contractor.

In 2015, INL RadCon initiated the restart of the Radiation Safety Program at Eastern Idaho Technical College. The collaborative effort between INL RadCon and Eastern Idaho Technical College began with an overhaul of the curriculum to optimize the students learning experience while preparing them for employment in either National Laboratories or commercial nuclear power plants. INL Radiological Control management was heavily involved throughout the duration of the course. INL sponsored a class tour of BEA facilities prior to providing eight weeks of supervised work experience. This work experience provided an opportunity for the students to take what they learned in school and apply it to the work environment. In an effort to provide experience that encompassed all aspects of the INL Radiological Control program, the students rotated between ATR, HPL, BOF and MFC over their eight weeks. This hands on approach gave managers, supervisors and peers the opportunity to provide students with real-time feedback, encouragement, expectations, etc. Each student was provided a qualification card that was used as their final grade; it was also used as part of the INL junior technician qualification for those that were hired. Since renewal of the program, there has been one graduating class and INL was able to hire 6 of 13 who completed the course. Fluor, Idaho also hired a number of the remaining students. This partnership is already proving to be a valuable pipeline for future Radiological Control/Health Physics Technicians at INL.

And finally, on September 21, 2016, the U.S. Department of Energy, Idaho Operations Office (NE-ID) approved INL's Radiation Protection Program (PLN-260), Revision 11. No conditions of approval were identified. These examples of RadCon improvements demonstrate commitment made to the program to become more efficient, eliminate redundancy, including concerns for longevity, while maintaining adequate and effective controls implementing ISMS core functions and guiding principles.

Environmental Management System (EMS): The EMS continues to be evaluated as effective when considering lab-wide EMS elements of environmental protection, environmental compliance, waste management, chemical management services and the efficiency and effectiveness of the elements of the EMS. The EMS is effectively integrated with ISMS. The ISO14001 EMS elements of environmental policy and plan-do-act-check are consistent with the five ISMS core functions. The environmental policy, updated and reissued to all employees in 2016, emphasizes a number of ISMS guiding principles including line management responsibility, employee roles and responsibilities, balanced priorities, hazard identification, tailored controls, and employee involvement. The remaining guiding principles (competence commensurate with responsibilities, identification of standards and requirements, and operations authorization) are integrated in lab-wide procedures and work planning and control documents. Most important to EMS effectiveness is the further maturation of the environmental element of the contractor assurance system (E-CAS). Processes within the CAS, specifically assessments, issues management, quarterly management review meetings (MRM), IOPAC, operation council, and senior MRM (SMRM) all included environmental management. These activities ensure employee involvement and management engagement at all levels; and facilitates continuous improvement.

Performance highlights included:

- Continued ISO14001 certification with no non-conformities as well as internal and external gap analyses indicating INL does not have significant gaps in meeting the 2015 standard in 2017; (SPOMC)
- A significant number of external regulator inspections related to air, water, and waste with no findings;
- >90% internal identification of environmental related issues compared those externally identified or that “found us” demonstrating positive employee behaviors, ensures timely return to compliance status, and mitigates potential environmental impacts; (SPOMC)
- Increased recycling efforts across the laboratory such as REC battery recycling and office recycling is meeting or exceeding DOE expectations;
- Laboratory and environmental risks have proactively mitigated as demonstrated by nearly 200 NEPA environmental checklists, clean closure of a RCRA facility, RCRA permit renewal, removal of a troubling underground storage tank, a decrease in waste backlogs, ATR evaporative pond liner replacement, initiating closure of five (5) unneeded deep injection wells, initiating closure of a sewage treatment pond to be followed by permit cancellation, and application for a permit to construct with facility emission caps to replace a major source Title V permit.

There were a number of environmental related issues encountered during the year, a significant number of which involved aging/deficient equipment and work planning/control errors. Though adverse, many also represent strengths in the management system.

Performance deficiencies included:

- Failure of WGS subcontractor to follow the NNSS WAC (employee identified; not following procedures)
- Two reportable petroleum spills, one from an identified leak in an ATR underground petro line that exceeded reportable quantities and another for an above ground flexible line which could not be cleaned up in 24 hours (SPOMC) (employee identified; aging equipment)
- DEQ Warning Letter for two minor deficiencies, Identification of portable eyewash stations that had been modified and 5-gal container of mixed waste not in the required tracking inventory (not following procedures)

Asset Protection Management System (APMS): APMS, sponsored by the Laboratory Protection (LP) Directorate, effectively maintained the systems and programs to fulfill LP’s mission to protect INL personnel, infrastructure, and material assets in support of missions and projects. As an essential component of Integrated Safety Management (ISM), LP maintains an effective assurance reporting system that includes the collection, analysis, and sharing of performance data and information that drives continuous improvement in the areas of identifying hazards, mitigation, clear roles and responsibilities, and line management’s responsibility for safety and oversight providing a safe work environment. The LP Management Review Meeting (MRM) is the opportunity for the LP Director and division directors to review overall Directorate performance, provide self-critical analysis, and challenge each other in performance and analysis, demonstrating an important ISMS guiding principle; line management responsibility for safety by ensuring that adequate controls are in place to identify and mitigate hazards, ensure roles and responsibilities are understood, requirements are rolled down, etc. The MRM also serves to broaden the discussion to include the understanding and application of ISM, human performance, safety culture, and what good performance looks like. The APMS tracks and reports on two *enterprise-level* key performance indicators for Emergency Management and Services Safeguard & Security:

Emergency Management Readiness Assurance – This KPI (in conjunction with other metrics) monitors the ability of the Emergency Response Organization (ERO) to ensure adequate personnel resources are available at all times to effectively perform activities necessary to minimize or mitigate

the effects of emergency events at INL. In FY 2016, emergency readiness was effective, with ongoing diligence being used to maintain the staffing needs of ERO personnel who are trained and qualified.

Incidents of Security Concern (IOSC) Rate – This KPI (in conjunction with other metrics) is a normalized value based on the number of IOSC and the actual hours worked during the accounting month. The metric provides an indication of BEA's effectiveness in implementing and complying with security policies, procedures, and expectations. In FY 2016, negative trends were being addressed by the Security Awareness & Training organization through awareness communications and a risk-based assessment planned for FY 2017.

In summary, the APMS effectively implements ISMS principles and core functions, maintaining the systems and programs needed to fulfill LP's mission. APMS and LP continue to be a learning organization that identifies improvement opportunities, reinforce performance expectations, and use lessons learned as part of continual improvement.

Management System Summary

These high level management system summaries have only included a small sample of the activities that are ongoing here at INL. They demonstrate elements of an effective ISMS framework that is designed to identify hazards, mitigate them, and protect the workers and the public while ensuring that requirements have been met, while competent and qualified employees oversee the work. Because of the numerous products such as: assessments, metric analysis, improvements, initiatives, actions taken, resolved issues, challenges, and identified risks, resulting from the collaboration of mission centers and management systems, all of which are instrumental in integrating safety core functions and guiding principles, can be reviewed in depth in the published MRM's, as mentioned above.

SAMPLE SUMMARY OF KEY METRIC INDICATORS (more in depth metrics and analysis is available in MRM's)

- Significance level of ORPS categories OE 1, 2, have decreased by approximately half, each of the last three fiscal years (FY 2013 = 19, FY 2014 = 11, FY 2015 = 5) and in FY 2016, INL reported five Significance Category 2 events.
- RadCon Reportable Events from 9 in FY 2012, to 4 in FY 2013 and 2014, 2 in FY 2015, and 3 in FY 2016.
- Average number of days between higher significant events has increased from 16 days in FY 2013, to 36 in FY 2014, 82 in FY 2015 and 72 in FY 2016. At the end of FY 2016, 107 days had passed since reporting a higher significance event.
- The increase in the rate of occupational injuries and illnesses evident in prior years has been successfully halted, and performance in recent years has since plateaued. Fortunately, the severity of these cases has substantially decreased, as indicated by the reduction in the DART Case Rate.
- In FY 2015 BEA started a campaign to reduce back and shoulder sprain/strain injuries. Currently the back and shoulder related injury rates have decreased by 29 percent (back and shoulder TRCR) and 43 percent (back and shoulder DART) in FY 2016, as compared to the FY 2010-2014 baseline. Approximately 75 percent of BEA staff attended the rollout of the program.
- Workers Compensation costs have declined significantly since FY 2013.

INL Strategy for a Safer Workplace

Actions that BEA has taken to improve and influence culture (key to improving the safety culture in the areas of Leadership, Employee Engagement, and Organizational learning as described in attachment 10 of DOE G 450.4-1C) at the Laboratory include:

- Established a core set of Safe Conduct of Research Principles
- Annual Culture Surveys
- Culture Survey Action Plans
- LOLA and LOSA Participation
- Increased VPP and ISMS Engagement

Laboratory-wide injury prevention target areas include:

- Situational Awareness
- Fitness for Duty
- Material Handling
- Ergonomic
- Slips and Falls

Organizational

- Scope Specific Injury/Illness Actions

Union Engagement

- Monthly Senior Management and Union Leadership Council
- Back and Shoulder Program Partnership

Monthly Laboratory Directors' Safety Council

- First kickoff meeting was in June 2016. The purpose of the Council is to allow the Laboratory Director and Senior Laboratory Management to meet on a monthly basis to increase safety dialogue and strategic focus on safety.

SAFETY PERFORMANCE OBJECTIVES, MEASURES, AND COMMITMENTS (SPOMC)

FY 2016 Summary:

The primary objective of safety related metrics is to achieve excellence and identify focused areas where improvement opportunities exist. Some examples of this progress were previously discussed in this report, but in its entirety INL reports on the Safety Performance Objectives, Metrics, and Commitments quarterly through the MRM reports, which are reviewed and analyzed in MRMs and are posted to the Performance Reporting SharePoint site for DOE-ID's review. Each MS Lead has the responsibility of evaluating performance and improvement to their MS with respect to safety related metrics, to work closely with implementing organizations to advance necessary improvements, and remain transparent to their DOE counterpart by keeping them informed when changes are made to the metrics within the reports. This transparency is intended to improve the understanding of safety related metrics and the communications between MS Leads and DOE-ID.

In addition to improvements in the quality of metrics and critical evaluation of performance as documented in the content of quarterly MRM reports, each of the MS Leads have demonstrated better understanding of the application and implementation of ISMS within their MS by being more self-critical to improve their efforts to protect people, environment, and assets. MSs continue to trend and analyze data that promote continual learning used to prevent events from recurring in the future.

FY 2015-2019 Performance Objectives (will remain the same, as these are long range objectives to be pursued over multiple years)

Be recognized by the complex for demonstrating an excellent culture with responsible and accountable employees and management engagement with increased presence in the field to further promote BEA's desired Safety Culture.

Demonstrate complex leading performance in injury illness rates, with emphasis and focus on an open reporting culture.

Demonstrate complex leading performance related to work control (i.e., personnel hazards are anticipated, identified, evaluated, and controlled through an effective application of elimination/engineering controls over administrative controls and use of personal protective equipment).

Demonstrate a continuous downward trend in radiological events and zero uptakes.

FY 2016 Commitments Summary

- Pilot a Work Control Risk Ranking tool within F&SS that quantifies risk reduction and evaluate future site wide application. This will include comparisons and evaluations of other risk ranking methods currently being used in other locations and organizations lab-wide, with an effort to adopt best practices to mature INL's program to best in class. **Completed**, Pilot of the Work Control Risk Ranking tool within F&SS was completed and formally evaluated to be an effective tool that lends itself to long term effectiveness within the organization and will continue to be utilized. Other organizations have established similar best practices that were also found to be effective, so it is not likely that this tool (F&SS Risk Ranking) will be institutionalized across the laboratory at this time.
- Maintain International Organization for Standards (ISO) 14001 Certification for INL Environmental Management System and prepare to implement the 2015 "Environmental Management Systems – Requirements with Guidance for Use", by the end FY 2017. **Completed**, the registrar completed two 6-month surveillances and recommended BEA for continued

certification with no findings or opportunities for improvement. **On Target as planned**, INL completed a 2015 gap analysis to the 2015 standard and had the resulting analysis reviewed by other Battelle Labs. Additionally, the registrar completed a one-day gap analysis to the 2015 standard. All analysis indicates INL, with the exception of minor documentation changes, has the critical program elements in place to meet the 2015 standard in 2017.

- Maintain Voluntary Protection Program VPP Star Status for the INL. **Completed**, the DOE headquarters review team completed its on-site review in September. The review team was pleased with the expertise and passionate commitment of all employees regarding safety at the laboratory, and commended INL's continuous improvement efforts. As such, the team will submit a letter to Energy Secretary Ernest Moniz recommending that INL continue participation as a DOE-VPP Star site.
- Continue efforts with the MOP program initiative, which includes implementation tools and training of Leading Behavior Traits. **Completed**, the Safe Conduct of Research Principles have been institutionalized, management engagement and expectations, training aids, and implementation tools are in progress.
- Dynamic Learning Center activities continue to expand and improve lab-wide, with emphasis on areas of specific high consequence work. **Completed**, the 2016 emphasis within the DLC has been improving on a real time basis, continually adapting to best practices and taking a questioning attitude to the next level to promote psychological safety and open candid dialogue which leads to a better learning culture positioned to catch and reduce error and improve behavioral choices and performance.
- Continue to improve the lessons learned process by focusing on rapid dissemination of preliminary lessons learned information as well as targeted distribution approaches based on relevance and significance to avoid desensitization. **Completed**, the use of the INL Lessons Learned Program continues to increase engagement of Operating Experience and lessons learned. The average number of views per month remains high and often exceeds the monthly goal of 1750 views. A recent completed surveillance (IAS16520) and numerous field observations identified several good examples of lessons learned used and internalized at the INL including: staff meetings, shift turnovers, job briefings, management observations, work planning, training, and facility communication tools, several good examples of internalization are discussed in the MRM's. INL has also received positive feedback from other sites across the complex on our own lessons learned and shared through OPEXShare, such as the FY 2015 arc flash event (rated #22 on the most popular, with 2392 views).

The Quick Communication Tool (**Completed**), as a lessons learned improvement initiative in FY 2016 was completed and went live on September 29, 2016. The purpose of the tool is to quickly share preliminary information concerning real time events, safety or other situations to the appropriate audience. Continued communication about the purpose and use of the tool will continue through the first quarter of FY 2017 by the Lessons Learned Program Technical point of Contact and other Contractor Assurance personnel.

FY 2016 Safety Performance Metric (SPM) Summary

Safety Performance DART/TRC: In June 2016, BEA noticed an uptick in injuries and significant events, two that were more significant: the fire truck/ambulance near miss and a finger injury at ATR as a result of equipment modification. In response, BEA took several proactive measures to heighten awareness and focus attention to detail, including an ATR Stand Down, a Laboratory Director safety video highlighting indicators (6/15/2016), an extent of condition review, and a manager tailgate of lessons learned. On 6/15/2016, the day of the video and manager action, a second severe finger injury occurred to a subcontractor, making the seventh injury occurring during this short span. Follow on actions included:

F&SS stand down of all subcontractors, extent of condition review - in progress, Standing Order and Letter of Notification issued to all trained LO/TO staff, an agenda topic at the Union Senior Leadership monthly meeting and a cause analysis in progress for both hand injuries. BEA is continuing to address this issue appropriately and aggressively.

Radiological Control (RadCon): The RadCon organization is always striving for continuous improvement. During FY 2016, RadCon implemented several new performance metrics in an effort to gain a better understanding of issues present within the organization. Control charts were developed and implemented in the first quarter FY 2016 for three of our performance indicators: human performance issues, posting/boundary issues and work control issues, to track and determine whether trends exist for those performance metrics. The two performance metrics monitored in FY 2016 for Safety Performance Metrics; RWP Violations Rate (RWPVR) and Personnel Contamination Event Rate (PCER) were selected because they can be used to represent the overall health of the RadCon program. The RWPVR may indicate inadequate hazard identification, less than effective controls for the hazards, poor radiation worker compliance with the established work controls, or an indicator of poor radiological work practices. The RWPVR showed significant improvement over FY 2016, with the rate of RWP violations/1000 RWP entries declining from 0.31 in the 1st quarter to 0.07 in the 4th quarter, which is lower than the goal of 0.2 violations/1000 RWP entries. The PCER is the number of personnel contaminations (both reportable and non-reportable) relative to the number of RWP entries per quarter, and is measured by those events with any detectable contamination on anything other than PPE (i.e., hair, skin, personal clothing, scrubs, etc.) per 1,000 RWP entries. PCER may be an indicator of poor radiological practices, noncompliance with radiological work controls, hazards not properly identified or controlled, or inadequate work planning. FY 2016 saw a slight increase in the PCER from zero (0) in the 1st quarter to 0.21 in the 4th quarter, which was above the goal of 0.15. These metrics provided valuable insight on the overall health of the RadCon program and will continue to be utilized in FY 2017.

Contractor Assurance System: Metrics showed strong performance with the timeliness of Occurrence Reporting and Processing meeting targets and showing an improving trend over the year. The significance of reportable events remains relatively low; meeting goals while maintaining a culture of reporting as evidenced through the issues management program and Initial Notification Report (INR) process. There was a significant decrease in the average age of open conditions (including those designated as long-term). Also, the Issues Management Performance Metric was updated to clarify criteria and drive consistency in evaluations. Scores consistently exceeded targets yet still self-identified the opportunity to continuously improve the adequacy of objective evidence when closing issues. These metrics provided valuable insight and will continue to be utilized in FY 2017.

Work Planning and Control (WP&C): The implementation and evaluation of a core set of metrics for Conduct of Operations and Work Control was accomplished in FY 2016, providing a predictive and/or leading indication of performance based self-critical engagement. Work control related efforts in FY 2016 have been focused on the identification of programmatic improvements. As a result, revision of the work control training modules and qualification standards were accomplished to ensure accurate standards for qualifications are in place that capture the needed knowledge, skills, and abilities, to safely execute identified tasks. To further improve the Work Control Metrics the implementation of a Quality Review Standard has been initiated that will provide supplemental metric data and aid in the identification of focused improvement areas for FY17. .

Environmental: The long-standing environmental performance metric for reportable releases and NOV's indicates a negative trend due to two petroleum releases from aging equipment; neither impacted worker safety, groundwater, or surface water. The release from the underground line at ATR is still undergoing soil sampling and modeling. The new FY 2016 metric for environmental CAS indicates a positive culture of identifying, reporting and resolving over 90% of environmental-related concerns versus identification

by an external entity or by a self-revealing condition. These efforts minimized impacts to the environment, greatly shorten the extent of non-compliant conditions, and fostered a positive relationship with regulators. As a result, INL received no NOVs and one Warning Letter for two reported minor non-compliances to the MFC hazardous waste permit. The safety related metrics for environmental are effective and will remain the same for FY 2017.

Proposed FY 2017 Commitments:

Work Control: Implement a review standard to measure the quality of maintenance work control documents through the use of "Quality Review Teams." Develop metrics to indicate trends and improvement areas that drive focused improvement actions.

Increase engagement and oversight activities in the area of Hazardous Energy Control in an effort to identify potential program weaknesses and more closely monitor performance trends.

Occupational Safety & Health: Maintain Voluntary Protection Program VPP Star Status for the INL.

ESH & Q Directorate: Evaluate training across the directorate during FY 2017. Streamline, eliminate redundancy, be more user friendly, archive and organize past history while ensuring the most up-to-date requirements are being met.

Environmental: Certify to the 2015 International Organization for Standards (ISO) 14001 "Environmental Management Systems – Requirements with Guidance for Use," by the end FY 2017.

Management System Improvement Initiative: This effort is to optimize and Integrate INL Management Systems that Enable Research, designed to simplify, and make more intuitive workflows that deliver value to users while seamlessly integrating all requirements.

Quality Management: Design and Roll Out a Quality Academy

In support of the Lab Agenda a Quality Academy will be designed to:

- promote line management engagement and ownership of the quality assurance program implementation
- enhance competence commensurate with responsibilities for the next generation of technical professionals
- promote a culture of quality into the line organizations through defining functional clarity and focus on ownership of quality principles/requirements

Proposed FY 2017 Safety Performance Metrics:

SPM Title	MRM Reports	POC (data collection)
<i>Safety Performance DART/TRC</i>	<i>ES&H</i>	<i>Tony Kavran</i>
<i>RWP Violations Rate</i>	<i>ES&H</i>	<i>Steve Baker</i>
<i>Personnel Contamination Event Rate (PCER)</i>	<i>ES&H</i>	<i>Steve Baker</i>
<i>Timeliness of Occurrence Reporting and Processing</i>	<i>Q&PM</i>	<i>Betsy Mitchell</i>
<i>Significance of ORPS reportable events</i>	<i>Q&PM</i>	<i>Betsy Mitchell</i>
<i>Issues Management Performance Metric (IMPM)</i>	<i>Q&PM</i>	<i>Myles Pawlaczyk</i>
<i>Average Age of Open Conditions</i>	<i>Q&PM</i>	<i>Myles Pawlaczyk</i>
<i>Maintenance Work Control Document Quality Review Standard</i>	<i>F&SS</i>	<i>Justin Aquino</i>

<i>Conduct of Operations Performance Index</i>	<i>F&SS</i>	<i>Justin Aquino</i>
<i>Work Control Performance Index</i>	<i>F&SS</i>	<i>Justin Aquino</i>
<i>Environmental (reportable releases and NOV's)</i>	<i>ES&H</i>	<i>Tim Miller</i>
<i>Environmental CAS (ratio of self-identified to 3rd party or self-revealing non-compliances)*</i>	<i>ES&H</i>	<i>Tim Miller</i>

* Emphasizes self-identification and resolution of non-compliances.

Indicates additional metric from FY 2016

Conclusion: BEA realizes that while accomplishing complex and diverse missions, there will be opportunity for lessons learned and improvement. BEA is vigilant to allocate resources not only to correct issues as they arise, but also to provide many predictive processes and resources toward prevention. INL's FY 2016 performance was effective and although there have been events that do not match our expectations, external reviews have confirmed fundamental elements are in place. Considering the year's entire performance and mission outcomes, INL has a resilient organization. When the accomplishments of the entire year are balanced, INL has met the objective of integrating an "*effective*" safety management system.

